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Family Control, Multiple Institutional Block-holders and Informed Trading

Abstract

This paper investigates how large family shareholders and institutional block-holders jointly influence informed trading and firm valuation in the Hong Kong stock market. It combines market microstructure research with studies on the governance roles of multiple block-holders and finds that institutional block-holders rely on their relative controlling power vis-à-vis family owners to mitigate problems associated with informed trading. They also use their ownership rights to improve the structure of informed trading. However, these governance roles are predominantly exercised by pressure-resistant institutional block-holders. Informed trading reduces firm valuation, while an improvement in its structure increases valuation. Therefore, the governance roles of controlling families and pressure-resistant institutional block-holders may have different implications in terms of investors' perceptions of private information risk.

JEL Classification: D82, G14, G34

Keywords: Ownership Structure; Family Control; Institutional Block-holders; Informed Trading; Hong Kong

1. Introduction

The financial community and regulators in emerging economies make substantial efforts to improve investor confidence by setting new accounting and disclosure rules that reflect international standards of good practice. However, recent scandals, such as Satyam in India, Citic Pacific in China, and SK Networks in South Korea, highlight the failure of firm-level corporate governance mechanisms to improve transparency and mitigate widespread private information risk in less developed stock markets. Several types of private information risk exist, such as informal flows of information between well-connected investors and managers of firms, managerial dealings on insider information or information manipulation. Informed trading, by incorporating private information into prices, plays a central role in revealing companies' fundamental investment value in efficient markets (Kyle, 1985; Easley and O'Hara, 2004). When investors suspect that there is a tendency to abuse private information, their informed trading can be more effective in influencing management than other forms of shareholder activism, such as takeovers, proxy fights, shareholders' proposals, etc. (Admati and Pfleiderer, 2009; Edmans, 2010). However, our understanding of the governance roles of informed trading is incomplete.

In addition, firms not only differ in terms of the level of overall informed trading, but also its structure, where structure is the difference between the level of informed trading with respect to positive and negative private information (Easley and O'Hara, 2004). Again, there is a paucity of previous research on the governance properties of the structure of informed trading as well as a lack of integration between corporate governance and market microstructure research. Clearly, this limits our understanding of the role of governance via informed trading. However, it is reasonable to suggest that this may be an important governance mechanism, which is particularly relevant for small institutional block-holders who do not have sufficient power to protect themselves against large controlling families in

many emerging markets. This paper addresses these conceptual and empirical gaps and examines how different constituent block-holders, including controlling families and a variety of institutional investors, influence informed trading, its structure and, ultimately, firm valuation.

Governance through informed trading represents a relatively unexplored mechanism that is related to the conditional loyalty of small institutional block-holders to a large controller, such as a family, and their willingness to support controllers' long term strategic decisions (Bushee, 1998; Wahal and McConnell, 2000). This is facilitated by buying equity via informed trading and/or the threat of exit via informed trades when minority investors detect abuse of private information by controllers. This paper acknowledges conditional loyalty by minority institutional block-holders to a large family controller, and differentiates between two dimensions of the governance roles by institutional investors. One dimension is related to an increase in their share ownership and an associated increase in their loyalty (Winton, 1993; Zwiebel, 1995; Kahn and Winton, 1998). This provides investors with a stronger incentive to promote the controllers' strategic decisions that aim at creating value. The second dimension is associated with the relative controlling power of institutional block-holders' vis-à-vis the large family owner. An increase in relative power makes the threat of exit via informed trading stronger and facilitates a coalition between controlling families and non-controlling institutional block-holders (Bennedsen and Wolfenzon, 2000). As a result, institutional investors can impact governance via informed trading and, ultimately, have an effect on company valuation.

This study makes four important contributions. First, the literature has used traded volume, bid-ask spread and trade classification data as indicators of informed trading although our understanding of the true extent in the stock market is incomplete (Anderson et al. 2012). For example, Aslan et al. (2010) indicate there is a lack of understanding about the

theory of how accounting and market factors create information risk or how they may be jointly determined with informed trading. This research makes a contribution to previous studies by linking ownership structure to informed trading in the stock market within a traditional corporate governance framework. However it should be noted that whilst these data do not include information on the specific traders results suggest that there are higher levels of informed trading in family firms than in non-family firms, in line with Anderson et al. (2012). We also show how differences in ownership structure affect conflicts between investors in terms of access to information and unequitable wealth redistribution to informed investors. Previous research has been predominantly focused on the negative aspects of informed trading. This is particularly in the context of short selling activities of hedge funds prior to negative private information disclosure aimed at enhancing their trading profits at the expense of un-informed investors (Massoud et al., 2011). We investigate the impact of controlling and institutional investors on informed trading in the stock market rather than in the market for short selling. This extends research by Anderson et al. (2012) on families' informed trading through short selling to analysis of their stock market trading, which is particularly important to family block-holders (Chan et al., 2010).

Second, our focus is on the effectiveness of informed trading as an important governance mechanism available to institutional block-holders with limited controlling rights that wish to protect their investment in firms under family control. We argue that corporate governance via informed trading can influence the overall level of informed trading as well as its structure. Specifically, we investigate how the interaction between institutional block-holders and families can lower the level of informed trading and change its structure in the price discovery process by increasing informed trading on positive information and reducing it on negative information.

Third, our analysis indicates that although informed trading may create conflicts between informed and un-informed investors, in emerging markets it is often not possible to have fully transparent transactions. Thus, the structure of informed trading can improve firm valuation, which benefits investors overall. Informed trading on positive strategic private information can contribute to firm valuation by promoting the share price to reflect the firm fundamentals, especially when they are related to undisclosed, positive private information.

Finally, by demonstrating that informed trading and its structure may be the transmission mechanism that links ownership patterns to firm valuation, we provide a new perspective on corporate governance and market efficiency. Although insider trading laws protect market investors from insider opportunism, they are not successful in promoting market efficiency in many emerging markets (Fernandes and Ferreira, 2009). Our analysis emphasizes the positive aspects of informed trading associated with institutional investors, which may improve market efficiency. This highlights possible links between corporate governance and market regulation in order to realize the benefits of insider trading laws more fully. This is particularly important in many stock exchanges in emerging economies that seek to achieve investor protection while promoting the price discovery function.

We test our theoretical assumptions using a sample of firms listed on the Hong Kong Stock Exchange. Although this paper focuses on a single market, Hong Kong shares many similarities with other stock exchanges, especially those from emerging economies that adopt the order-driven, non-specialist stock market structure (Comerton-Forde and Rydger, 2006). As one of the largest developed order-driven, non-specialist equity markets, the Hong Kong Stock Exchange provides institutional support for a liquid and efficient market (Morck et al., 2000). It also mitigates market structure-related factors such as dealer inventory and market maker monopoly power in observing orders. These both can explain informed trading activities in many developed quote-driven and specialist markets such as the New York Stock

Exchange (Comerton-Forde and Rydge, 2006; Stoll and Whaley, 1990; O'Hara and Oldfield, 1986; Brockman and Chung, 2000). In addition, Hong Kong has a high level of family ownership concentration in listed companies and the launch of the Mandatory Provident Fund in 2000 has increased institutional investors' participation in corporate governance¹. According to Claessens et al. (2000), family owners control more than 64 % of the public companies listed on Hong Kong Stock Exchange, similar to many emerging economies as well as those in continental Europe (Bebchuk and Weisbach 2010). However, a substantial volume of information transmission is facilitated through private channels or Chinese *guanxi*. This means that both strategic and operational information can be easily hidden by insiders, leaving minority shareholders largely un-informed. Therefore, the Hong Kong stock market highlights the importance of firm-level governance in explaining private information contained in order imbalances and thus is an important laboratory to explore the corporate governance effects of family and institutional owners on informed trading. Finally, the Hong Kong Stock Exchange is similar to many countries that have insider trading legislation but which lack effective enforcement (Bhattacharya and Daouk, 2002; Beny, 2007), so our results may have wider implications. Many developed economies, such as the US and the UK that adopt quote-driven and specialist stock market structures, have a lower level of family ownership concentration in listed companies and relatively higher quality disclosure than Hong Kong. Such differences make the Hong Kong stock exchange more representative of non-US/UK market, especially in many emerging countries, and the results of our research more likely to be generalised to these economies.

The remainder of the paper proceeds as follows. Section 2 develops hypotheses. Section 3 presents the data, methods and main empirical results. Section 4 concludes.

¹ See Cap 485 Mandatory Provident Fund Schemes Ordinance Ord. No. 4 of 1998 and Mandatory provident fund schemes authority website <http://www.mpfa.org.hk> for more information about the Mandatory Provident Fund Schemes in Hong Kong,

2. Theory and hypotheses

Previous research has established an association between ownership concentration and disclosure decisions or disclosure quality. From an agency perspective, ownership concentration stimulates owners' incentives to seek private benefit of control, which diminish corporate transparency (Claessens and Fan, 2002; Makhijia and Patton, 2004; Faccio et al., 2001; Lang et al., 2004). When large block-holders reduce corporate transparency for self-serving reasons (that is, to increase opportunistic opacity), they try to suppress private information that may have a negative impact on the share price (Attig et al., 2006; Chin et al., 2006). They may also reduce corporate transparency for strategic reasons (that is, strategic opacity), to protect proprietary information associated with the firm's competitive advantage, such as intangible assets and R&D (Ball et al., 2003; Verrecchia, 2001). Both perspectives imply that price efficiency will be more reliant on informed trading to correct mispricing. Thus, previous studies suggest there is a positive relation between ownership concentration and the overall level of informed trading, whether based on positive or negative private information.

These arguments are particularly important in the context of family-controlled, publicly-listed firms. This form of ownership structure is widespread in many emerging and developed economies, such as India, South Korea, Singapore and Taiwan (Villalonga and Amit, 2006; Anderson and Reeb, 2003; Holderness and Sheehan, 1988; Bertrand et al., 2008; Claessens et al., 2002). Previous research on family control indicates that the availability and quality of information disclosure are key factors in the attempts of outside minority shareholders to monitor families, and they significantly influence the distribution of wealth between families and minority shareholders (Bushman et al., 2004). A number of studies suggest that in emerging economies, family shareholders have a strong incentive to distort information disclosure and mislead minority shareholders to gain private benefits of control

(Anderson et al., 2009). Supporting this view, Filatotchev et al. (2011) find that family ownership leads to a higher level of trading on private information.

2.1 Institutional block-holder power and informed trading

As indicated above, many family-controlled, publicly-listed companies also have institutional investors as minority shareholders, and previous research suggests that the interactions between these two types of shareholders may have a significant impact on the agency costs of the firm (Maury, 2006). Due to their superior resources and experience in collecting and processing information, institutional block-holders are more likely to detect family owners' private information compared to small individual investors (Campbell and Kracaw, 1980). Using data from the US, Edmans (2010) suggests that a higher level of institutional block ownership can increase the credibility of their potential threat to exit via informed trading in companies with a relatively diversified ownership structure.

In East Asia, where family block-holders dominate, non-controlling institutional block-holders also may impose restraints on controlling families through threat of potential exit via informed trading (Edmans 2010). We argue that the overall credibility of this threat depends on the relative power of non-controlling institutional block-holders and family owners, and this may be more relevant than their absolute ownership. We define the relative power of non-controlling investors over a controlling family as the ratio of their cumulative shareholdings to the share ownership of the controlling family. When the relative power of the institutional block-holders vis-à-vis family owners increases, the threat of their informed trading on negative information as perceived by family owners becomes more credible. This increases the likelihood that the controlling family will behave less opportunistically to retain the loyalty of non-controlling institutional block-holders and reduce the level of informed trading. Therefore, non-controlling institutional block-holders' relative power may play a

strong governance role that reduces family opportunism, and we suggest the following hypothesis:

Hypothesis 1: There is a negative relation between institutional block-holders' relative power with regard to family owners and the level of informed trading

2.2 The effect of non-controlling institutional block-holders on the structure of informed trading

Previous arguments focus on the opportunistic opacity of the firm. However, full transparency can also be damaging to investors because it leads to disclosure of strategically important information that may damage their portfolio firms' long term competitive advantage (Verrechia, 2001). In this context, institutional block-holders may protect the confidentiality of their strategic private information, such as R&D and investment in intangible assets (Bushee, 1998; Wahal and McConnell, 2000). Because of this loyalty by institutional block-holders, controlling families have an incentive to reveal proprietary, firm-specific private information exclusively to them rather than to diffused minority shareholders (Bhattacharya and Chiesa, 1995; Yosha, 1995). Therefore, institutional block-holders can effectively act as monitors, which ensure the firm maintains strategic opacity but reduces opportunistically opacity. This results in an improved structure of informed trading with more trading based on positive private information and less on negative private information.

Ultimately, institutional block-holders can gain superior profits associated with informed trading by buying more shares before strategic information is available to the market. At the same time, the controlling family benefits from institutional block-holders' positive informed trading as this can signal their strategic positive private information to the public and increase the share price prior to public disclosure. The more shares held by institutional block-holders, the better their interests are aligned with the objectives of the controlling family to protect and signal strategic opacity to the market via positive informed trading. Thus:

Hypothesis 2: There is a positive relation between institutional block-holder ownership and the structure of informed trading

2.3 The governance role of different non-controlling institutional block-holders

Our previous arguments consider the effects of institutional investors as a group. However, more recent studies indicate that institutional investors are far from homogeneous, and in terms of their governance roles they may be classified into three groups depending on the strength of their business links with their portfolio firms. These can be defined as pressure-resistant, pressure-sensitive, and pressure-uncertain (Brickley et al., 1988; Almazan et al., 2005; Chen et al., 2007). Chen et al.(2007) argue that because of the lack of business links with firms, pressure-resistant institutional block-holders, such as mutual and investment funds, are more independent and effective monitors than other institutional investors (such as occupational pension funds). This suggests that pressure-resistant institutional block-holders are more likely to force family owners to reduce opportunistic opacity because their threat of negative informed trading is more credible and, therefore, more effective. Pressure-resistant institutional block-holders are also more likely to be loyal to the large family owners in creating strategic opacity and are more likely to initiate positive informed trading to avoid discounting prices (Kahn and Winton, 1998). To outside investors, the presence of pressure-resistant institutional block-holders can be an indication of family commitment to minority investors (Bennedsen and Wolfenzon, 2000). This signal attracts more investors to the firm, which further promotes informed trading activity in the market and incorporate positive private information into the share price without public disclosure. Therefore, non-controlling, pressure-resistant institutional block-holders may play a strong governance role in family-controlled firms compared to other types of investors, both in terms of overall informed trading and its structure. Hence:

Hypothesis 3: There is a strong negative relation between pressure-resistant institutional block-holder relative power with regard to family owners and the level of informed trading compared to other types of institutional block-holder.

Hypothesis 4: There is a strong positive relation between pressure-resistant institutional block-holder ownership and the structure of informed trading compared to other types of institutional block-holder.

2.4 The effect of the structure of informed trading on firm value

Agency research suggests that large family owners can become more entrenched in an increasingly opaque information environment (Anderson et al., 2009). In this case, investors recognise potential risk of expropriation by large family shareholders that prompts un-informed investors to assume that all private information is negative (Akerlof, 1970). As a result, to acquire equity in firms with higher information risk, investors demand a higher rate of return or higher price discount (Easley and O'Hara, 2004). Therefore, there should be a negative relationship between overall informed trading and company valuation (Filatotchev et al., 2011).

We build on this research and argue that institutional block-holders in general, and pressure-resistant investors in particular, can encourage the strategic opacity of the controlling family and change the structure of informed trading by focusing on positive private information. However, previous studies neglect to comment on whether their efforts to change the structure can benefit other minority investors who remain un-informed. If this change in structure can reduce information asymmetry between a controlling family and outside minority shareholders, the governance outcomes of an improved structure of informed trading should result in a higher overall share price (Verrecchia, 2001). In this case, the reduction in negative informed trading directly reflects reduced information asymmetry with respect to opportunistic opacity. Alternatively, informed trading on positive strategic private information indirectly reflects reduced information asymmetry with respect to strategic opacity because markets can still incorporate this into the share price thus improving price discovery (Boehmer et al., 2005) and reducing the probability of undervaluation (DeLong et al., 1990). If the market has more public information due to reduced opportunistic

opacity while incorporating more undisclosed positive strategic private information, more efficient price discovery will result. The combined effects of the structure of informed trading will lead to a significant improvement in a market that lacks public information and fails to incorporate positive strategic private information (Easley and O'Hara, 2004). Hence:

Hypothesis 5: There is a positive relation between the structure of informed trading and company valuation.

3. Data, estimation and results

3.1 Sample

To test our hypotheses we have obtained data on all 812 companies listed on the Hong Kong Stock Exchange (Main Board) in 2006. Following common practice, we excluded financial institutions (two-digit SIC codes from 60 to 67), 164 companies with missing data and 54 companies with corner solutions for the informed trading estimation and those with xtreme values for the control variables. The final sample includes 447 companies: 51 (11.41%) from the building and construction sector; 40 (8.95%) from the electronic and electrical equipment industry; 27 (6.04%) from wholesale trade in durable goods; 20 (4.47%) from the chemicals industry; 20 (4.47%) from business services; and 16 (3.58%) from the communications sector. The remainder is widely distributed across other sectors.

To identify family and institutional block-holdings, ownership data were obtained from multiple sources including annual reports, OSIRIS, WorldScope, and the Bank of China (Hong Kong)-QianLong databases. We defined family firms are those whose largest shareholder is the family, and the family owns at least 10% shareholding. Control variables were from Datastream and WorldScope, in line with previous market microstructure research.

To measure the level of informed trading the market microstructure model of Easley et al. (1997a, b) was used, which requires daily numbers of buy and sell orders for a minimum of 40 trading days (Easley et al., 1998). High frequency trade transaction data and

bid-ask data for Hong Kong-listed companies from April 1 to June 30 2006 were obtained directly from the HKSE with the requisite 40 trading days. This period was not subject to any special events such as high market volatility, major policy changes or economic recession.

3.2 Variable construction and definitions

Compared with alternative proxies of informed trading, the probability of information-based trade (PIN) estimated by the market microstructure model of Easley et al. (1997a, b) is the measure of choice for several reasons. It provides a more direct and comprehensive measure of informed trading that is stable in the long-term, plus it captures the underlying structure of informed trading by revealing the different composition of informed trading based on positive or negative private information. It is superior to spread-based proxies of informed trading as these are more likely to capture short term factors associated with responses to dealers' inventory order imbalance than long-term information asymmetry (Callahan et al., 1997; Madhavan et al., 1997). The PIN method avoids econometric and interpretation problems associated with spread-based measures of information asymmetry (Callahan et al., 1997; Neal & Wheatley, 1998; O'Hara, 1995). Further, PIN is superior to other proxies for private information used in earlier accounting and finance literature, such as analyst coverage (Lang et al., 2004; Lang & Lundholm, 1996), abnormal accruals and earnings informativeness (Warfield et al., 1995), and the opacity index (Anderson et al., 2009). PIN captures more private information risk by using information on decisions by all stock market participants rather than individual analysts' forecasts and it clearly focuses on private information risk as the ultimate outcome of public disclosure decisions. PIN is more effective as it represents a reliable and stable firm information structure that captures long-term private information abuse risk in the stock market (Easley et al., 2002). Finally, by decomposing PIN into the different nature of informed trading based on positive or negative private information, the difference between the levels of each can be used to measure the structure of informed

trading, which is one of the key contributions of this paper. Although some researchers (for example, Mohanram and Rajgopal, 2009; Duarte and Young, 2009) raise concerns that PIN captures liquidity risk rather than information risk in explaining asset returns, recent research on bond (Li et al., 2010) and stock markets (Aslan et al., 2010) show that PIN represents an information risk rather than liquidity metric. Venter and Jongh (2006) suggest an extension of PIN that improves the fit of the model. However, while the PIN model may impose a downward bias on the possibility of detecting informed trading (Boehmer et al., 2007) it does not invalidate the results here.

It is impossible to identify the informed traders with private information specifically but the presence of informed trading in the market can be inferred from large imbalances between the number of buy and sell orders. On an ordinary trading day without private information releases, trade orders from buyers and sellers are roughly balanced. However, when private information is obtained by some market participants, there will be a large imbalance in the order flow, with buyer- or seller-initiated trades playing a dominate role. The probability of an informed trade with private information has the following form:

$$PIN = \frac{\alpha\mu}{\alpha\mu + \varepsilon_s + \varepsilon_b} \quad (1)$$

The numerator is the expected number of informed trades (that is, the product of the probability of a trading day with private information α and the arrival rate of informed trading μ). The denominator is total trading activity, including both informed trading $\alpha\mu$ and the arrival rate of un-informed buy orders ε_b and sell orders ε_s . Under sufficient independence conditions across trading days, the trading parameters $\theta = (\alpha, \delta, \mu, \varepsilon_s, \varepsilon_b)$ are estimated simultaneously by maximizing the likelihood function

$$V = \prod_{i=1}^I L(\theta | B_i, S_i) \quad (2)$$

for each share for at least 40 days. The daily numbers of buyer- or seller-initiated orders

(B_i, S_i) are sufficient statistics to estimate the parameter vector θ and calculate PIN. For each single trading day i , this likelihood L is a mixed distribution where the trade outcomes are weighted by the probability of it being a good news day, $\alpha(1-\delta)$, a bad news day, $(\alpha\delta)$, and a no news day, $(1-\alpha)$. The trade process for a single trading day is:

$$\begin{aligned} L(\theta|B, S) = & (1-\alpha)e^{-S_b} \frac{\epsilon_b^B}{B!} e^{-S_s} \frac{\epsilon_s^S}{S!} \\ & + \alpha\delta e^{-S_b} \frac{\epsilon_b^B}{B!} e^{-(\mu+S_s)} \frac{(\mu+\epsilon_s)^S}{S!} \\ & + \alpha(1-\delta)e^{-(\mu+S_b)} \frac{(\mu+\epsilon_b)^B}{B!} e^{-S_s} \frac{\epsilon_s^S}{S!} \end{aligned} \quad (3)$$

Each trade is specified as buyer- or seller-initiated using the standard Lee–Ready algorithm (Lee and Ready, 1991), which classifies any trade above (below) the midpoint of the current quoted spread as a buy (sell) because trades originating from buyers (sellers) are most likely to be executed at or near the ask (bid). For trades taking place at the midpoint, a tick test based on the most recent transaction price is used to classify the trade. Large trades are broken down and matched against multiple investors. Following Hasbrouck (1988), all trades occurring within 5 seconds of each other are classified as a single trade.

The structure of informed trading is measured by the difference between the level of informed trading on positive and negative private information (DF). The level of informed trading on positive private information (PPIN) is measured by:

$$\text{PPIN} = \frac{\alpha(1-\delta)\mu}{\alpha\mu + \epsilon_s + \epsilon_b} \quad (4)$$

and for negative private information (NPIN) is measured by:

$$\text{NPIN} = \frac{\alpha\delta\mu}{\alpha\mu + \epsilon_s + \epsilon_b} \quad (5)$$

Therefore the difference is measured:

$$\text{DF} = \text{PPIN} - \text{NPIN} \quad (6)$$

Following the finance literature, Tobin's Q is used to measure firm performance and defined as the market value of total assets divided by the book value of total assets, at year

end 2006. Tobin's Q reflects a forward-looking, market-based performance proxy that is important for the overall welfare of all investors. Compared with a trading performance measurements such as CAR/BHAR that are only important to a subset of investors that adopt a particular trading strategy based on some special event, Tobin's Q is preferred here given the corporate governance emphasis of the paper (Anderson et al., 2009; Bruno & Claessens, 2010; Morck et al., 1988). In this study, we are not focused on any particular event. Rather, we talk about a continuous information environment associated with the company. Therefore, our focus will be on investor evaluation related to this environment, which is captured by Tobin's Q, and how the continuous dynamic price discovery process via informed trading affects valuation. In the sensitivity tests, we used market value of common equity to book value of common equity (M/B) as the alternative performance measure, and the results were robust.

Family ownership is a key variable in our analysis. This variable is defined as the equity holding of the largest individual shareholder and close family. Following Claessens et al. (2000), membership of the controlling family is identified by linking corporate insiders including CEO, board members, board chairman, honorary chairman and vice chairman that share a common family and second name with the largest owner. The shareholding of individual family members is summed to define the total for the family. In addition to the share ownership stakes directly owned by the controlling family, ownership by outside firms controlled by the same family are also included. The latter accounts for an ownership pyramid effect that may increase voting power beyond the limits of immediate share ownership (see Zingales, 1995, for a discussion). Since in many emerging economies large control stakes are common (La Porta et al., 1999), minimum thresholds for family ownership (for example, 10%, or 20%) are usual in the literature (Claessens et al., 2000). In line with previous research, a family firm dummy was created that is equal to 1 if the largest controller

is a family with at least 10% shareholding, 0 otherwise. When we used a similar dummy using a 20% cut-off, our results were the same.

All institutional investors with more than 5% shareholdings are considered as institutional block-holders. Following Brickley et al. (1988), institutional block-holders are defined as pressure-sensitive, pressure-resistant and pressure-uncertain based on their business links with their invested companies. The pressure-resistant group only includes pension funds, investment companies, independent investment advisors and independent research institutes and foundations, which are less likely to have business links with their invested companies. Banks, bank trusts and insurance companies which are more likely to have such business links are included in the pressure-sensitive group. Industrial and public institutions, and other unclassified institutional investors whose business links with the invested companies are not clear are put into the pressure-uncertain group.

To capture the institutional block-holders' relative power in large family controlled multiple block-holder ownership structures, the ratio of the ownership of institutional block-holders to that of the controlling family is calculated. To capture the relative power of different types of institutional block-holders, the ratio of the ownership of each type of institutional block-holders to that of the ownership of the controlling family is constructed.

To avoid spurious correlation in informed trading (PIN) regressions, we control for factors that may affect the level and structure of informed trading. Previous research suggest that firm size may have an information effect (Barry and Brown, 1984; Easley et al., 2002; Anderson et al., 2012; Diether et al., 2009). Thus, the natural logarithm of equity market capitalisation at end 2006 is used to control for firm size. Previous research also indicates that liquidity measured by trading volume signals a demand shock that can lead to higher future return (Llorente et al. 2002) while illiquid stocks are less likely to be of interest to informed traders (Shleifer and Vishny 1997). Therefore the natural logarithm of the mean monthly

trading volume in 2006 is used to control for liquidity factor. Risk of future value is a prerequisite for information asymmetry (Huddart et al. 2007), which can be captured by volatility (Demsetz and Lehn 1985). To control for risk and uncertainty in informed trading decisions the standard deviation of daily share returns in 2006 are used. Aslan et al. (2010) find that PIN has a small negative correlation with firm growth and profitability. Growth is measured as the change in revenues change from 2005 to 2006 divided by revenues in 2005. To control for profitability in informed trading, we use the previous period return on equity capital measured by the ratio of EPS over the book value per share in year 2005. Easley et al (1998) suggest that analysts may turn private information into public while Aslan et al. (2010) find older firms tend to have low PIN. To control for financial analyst and firm age-related factors in informed trading, we use firm age measured by the natural logarithm of the number of years the company has been listed on the Hong Kong Stock Exchange in 2006 and financial analysts' coverage is measured by the natural logarithm of the number of the first year forward EPS estimates available from Institutional Brokers' Estimate System (I/B/E/S) in 2006. To control for level of indebtedness firm leverage is used measured by the ratio of long term debts over book value of total common equities in year 2006 and finally industry effects are controlled by 2 digit SIC codes.

In the regressions with Tobin's Q as the dependent variable we control for a number of other firm characteristics and industry factors that potentially affect firm valuation (Anderson et al., 2009; Filatotchev et al., 2011). We control for firm size measured by the natural logarithm of market capitalisation of common equities in the end of 2006; growth opportunities measured as the sales growth in year 2006; firm leverage measured by the ratio of long term debts over book value of total common equities in year 2006; and prior performance is measured by the ratio of EPS over the book value per share in 2005. Finally, potential sectoral effects are controlled by the industry dummies.

Table 1 Panel A reports the descriptive statistics. The mean informed trading level is 0.30 and the mean difference between positive and negative informed trading is -0.02. This is similar to Lai et al. (2009) who find that the mean informed trading level in Hong Kong is 0.337. Easley et al. (2002) find that on average 19% of the trades on the New York Stock Exchange (NYSE) convey private information with a informed trading structure of 0.06 (that is, a positive informed trading dominated structure). In our sample, there is not only a higher overall level of informed trading but also a higher probability that private information event days are associated with negative private information (50.8%), representing a worse structure of informed trading. The relative intensity of trading by informed investors can be measured by the ratio of the arrival rate of informed trades over the arrival rate of un-informed orders. On the NYSE, the relative intensity of informed trading is 1.34 (Easley et al., 2002), whereas it is 1.90 on HKSE. These differences are consistent with the characteristics of Hong Kong as a market with weaker investor protection and less rigorous disclosure.

Table 1

In terms of ownership, 361 firms, or 80.76% of the sample, are controlled by families. On average, the largest family controls 48.77% of outstanding shares. The distribution of ownership concentration shows that families with shareholding between 0–20%, 20–35% and over 35% control 5.82%, 11.86% and 63.08% of sample firms, respectively. Therefore, compared with other Asian countries, the percentage of firms controlled by the largest family shareholders in Hong Kong is high.

In our sample, 173 firms, or 38.70% of the total, have ownership by institutional block-holders and on average, these control 14.09% of the outstanding shares. Pressure-resistant, pressure-sensitive and pressure-uncertain institutional shareholders control 12.15%, 9.19% and 11.96% of the outstanding shareholdings on average, respectively. Thus, besides family ownership, institutional investors in Hong Kong also hold significant blocks of shares.

The relative power of institutional block-holders over the largest family in a single firm is 0.38 on average. Amongst different types of institutional block-holders, pressure-resistant investors have a relative power of 0.31 on average, while pressure-sensitive and pressure-uncertain investors have relative power of 0.26 and 0.40 respectively. The greatest relative power by institutional block-holders over the largest family in a single firm is 2.40. This suggests that, while overall institutional block-holders do not have sufficient share ownership to challenge families, in some cases their relative power is quite significant.

Table 1 Panel B reports the correlation matrix of the key variables. It shows that family ownership is positively correlated with the level of informed trading, suggesting that family owners are more likely than non-family owners to stimulate informed trading activities. It also shows that family ownership is negatively correlated with the structure of informed trading. Regarding non-controlling institutional block-holders, Table 1 Panel B shows that their relative power over family is negatively correlated with the level of informed trading. Such correlation suggests that non-controlling institutional block-holders can mitigate informed trading activity in family firms, in line with hypothesis 1. Table 1 Panel B also shows that non-controlling institutional block-holders' ownership is positively correlated with the structure of informed trading. This suggests that non-controlling institutional block-holders can improve the structure of informed trading, in line with hypothesis 2. The level of informed trading is negatively correlated with Tobin's Q while the structure is positively correlated with Tobin's Q.

3.3 Estimation and results

Table 2 reports the OLS regression results for the effects of institutional block-holders and family owners on the level and structure of informed trading. Models 1, 2 and 3 focus on the level of informed trading (PIN). Model 1 includes family ownership only. Model 2 adds institutional block-holder ownership, and Model 3 adds the relative power of institutional

block-holders over the family. Model 1 shows there is a significant and negative relation between family ownership and informed trading, consistent with Filatotchev et al. (2011) and Anderson et al. (2012). Although Model 2 shows there is no significant relation between institutional block-holder ownership and informed trading, Model 3 shows there is a significant and negative relation between the relative power of institutional block-holders over the family and the level of informed trading. These findings suggest that to influence family transparency levels, institutional block-holders use their relative power over family owners. This represents their loyalty to the family rather than their absolute ownership and ability to exert pressure and mitigate opportunistic opacity associated with family owners, supporting Hypothesis 1.

Table 2 Model 4 reports the regression results of the effects of institutional block-holders and family owners on the structure of informed trading (DF). As Model 4 shows there is no significant relation between institutional block-holders relative power over family owners and the structure of informed trading, but there is a significant and positive relation between institutional block-holders ownership and the structure of informed trading, in line with hypothesis 2. These results again confirm that institutional block-holders ownership and relative power over the largest family are different dimensions of multiple block-holder ownership structure characteristics. Institutional block-holders' absolute shareholdings, representing their loyalty to family owners, give them enough incentive to change the structure of informed trading, while their relative power becomes less crucial in promoting strategic opacity.

With respect to control variables in the informed trading regressions, Table 2 indicates that the informed trading level is higher in small firms and those with lower liquidity. These results are consistent with Aslan et al. (2010), who find that smaller firms have less transparency and those with limited trading activity are less attractive to uninformed investors. Table 2 also indicates that the level of informed trading is lower in firms

with large analyst coverage, consistent with Easley et al. (1998). Firms with higher daily return volatility have lower informed trading level, indicating that higher potential returns may lead to an increase in speculative activity by un-informed investors.

With respect to control variables in the structure of informed trading, Table 2 indicates that larger firms and those with higher liquidity and daily return volatility reflect a positive effect on the structure of informed trading. Aslan et al. (2010) argue that firms with more volatility present greater profit opportunities for informed traders. The findings here further support the view that bigger, more liquid and more risky firms presenting greater profits for informed traders may contain more strategic private information and have more positive informed trading. Table 2 also provides evidence that firms with high growth opportunities have a negative effect on the structure of informed trading, consistent with Aslan et al. (2010) who find that informed traders seek out the truly profitable firms while un-informed traders overestimate firms with high growth opportunities.

Table 2

Table 3 reports the effects of the different types of institutional block-holders and family owners in informed trading and its structure. As Model 5 shows, there is a significant and negative relation between pressure-resistant relative power over the controlling family and informed trading. There is no significant relationship between the relative power of pressure-sensitive/pressure-uncertain institutional block-holders and informed trading. This suggests that pressure-resistant institutional block-holders are more likely than other block-holders to use their relative power over families in order to mitigate opportunistic opacity and overall informed trading, supporting Hypothesis 3.

Table 3 Model 6 shows there is a significant positive relation between pressure-resistant institutional block-holder ownership and the structure of informed trading. There is no significant relation between the ownership of pressure-sensitive/pressure-uncertain

institutional block-holders and the structure of informed trading. These findings show that pressure-resistant institutional block-holders are more likely than other institutional block-holders to promote strategic opacity and change the structure of informed trading, supporting Hypothesis 4.

Although we control for a variety of firm-specific characteristics, we also perform a robustness test by comparing family firms to similar non-family firms by constructing a propensity score matched sample, following Anderson et al. (2012). Using a logit model with the family firm dummy as the dependent variable, we match family to non-family firms based on pressure-resistant, pressure-sensitive and pressure-uncertain institutional block-holders ownership, market capitalization, liquidity, daily return risk, return on equity, growth, analyst coverage, and firm age. Following Caliendo and Kopeinig (2008), our propensity score model uses one to one matching, a radius/caliper of 0.1, and a common support range of (0.30 to 0.99). Finally, we allow observations to be used as a match more than once, thus making the order of matching irrelevant. The matching process yields a sample of 361 family firms and 361 non-family firms and the results using the propensity score matched samples are in Table 3 Models 7 and 8. Consistent with earlier results, the matched sample analysis suggests that pressure-resistant institutional block-holders' relative power over families is more likely than other block-holders to mitigate overall informed trading while their absolute ownership is more likely to improve its structure than other block-holders, supporting Hypotheses 3 and 4.

Table 3

Table 4 reports the effects of informed trading and its structure on company valuation measured by Tobin's Q. Model 9 shows a significantly positive relation between the structure of informed trading and company valuation, supporting Hypothesis 5 and

suggesting that a good structure with more informed trading on positive private information and/or less on negative private information improves firm valuation.

The firm-level component of private information risk reflects intentionally distorted disclosure by managers and/or a lack of scrutiny by investors and market intermediaries (Anderson et al., 2009). This can discount the share price at a higher rate than market wide private information (Chordia et al., 2002; Bardong et al., 2008). In contrast, where there is information symmetry, if investors expect that firm-level private information is more likely due to managerial strategic rather than opportunistic opacity, confidence in interpreting strategic positive private information signals can be improved (Bhattacharya, 1979). This in turn can improve share valuation (Stocken, 2000; Trueman, 1986). Given the above, it is expected that investors will put a bigger discount on informed trading based on firm-level private information than overall informed trading, and a bigger premium on the expected structure of informed trading than the overall structure of informed trading. In Table 4 Models 10 and 11 we provide results of the two-stage least square (2SLS) regressions using the fitted values of PIN from Model 5 and the fitted values of DF from Model 6 (see Pagan, 1984). The market-wide private information, which is common across all listed firms, is captured in the error term and removed from the explained component of informed trading. The explained component of the structure of informed trading captures the signal that outside investors can expect based on firm-level characteristics. Explained PIN and explained DF are separately introduced in Models 10 and 11 to avoid multicollinearity.

Results for Model 10 show that the fitted informed trading level has a significant and stronger negative effect on firm valuation compared to the overall informed trading that also contains market-wide private information risk, consistent with Filatotchev et al. (2011). This stronger negative relation between the informed trading based on firm-level private information and firm performance shows that investors place greater valuation discounts on

the firm-level governance-related proportion of private information risk than the total private information risk that includes market-wide risks.

Results in Model 11 show that the fitted structure of informed trading has a significant and stronger positive effect on firm valuation compared to the overall structure of informed trading that also contains the component that is unexplained to outside investors. This stronger positive relation between the explained structure of informed trading and firm valuation shows that investors place a greater premium on the portion of the structure of informed trading explained by firm-level governance-related characteristics than the overall structure of informed trading.

Finally, in Model 12 all governance variables are included, plus explained PIN ($E[PIN]$), and explained DF ($E[DF]$), and the control variables. Model 12 shows that after controlling for explained informed trading and its structure, family ownership has a positive impact on company valuation, while pressure-resistant institutional block-holders have a negative impact on company valuation. The firm-level explained informed trading is still significantly and negatively associated with firm valuation, consistent with Filatotchev et al. (2011). The explained PIN and DF remain significant with different signs, suggesting that although informed trading decreases company value, a good structure of informed trading increases it, as predicted in this framework.

Table 4

These findings indicate potential differences in the wealth-generation and wealth-distribution governance roles of the controlling family and multiple institutional block-holders. If the firm was absolutely transparent to outside shareholders, such an information environment removes controlling family opportunism that leads to unfair wealth distribution amongst investors. It also removes the demand for a governance role by non-controlling institutional block-holders via informed trading to promote and monitor wealth generation

and distribution among investors. Therefore, outside investors may put a premium on the enhanced monitoring capacity by the family and their longer term commitment to growth, but a discount on non-controlling institutional block-holders because this gives them a trading advantage before the market is fully informed. This leads to unfair wealth distribution to institutional block-holders via informed trading at the cost of un-informed investors. These findings have implications for regulators as in a more transparent market such as the US, institutional block-holder wealth distribution via informed trading can lead to conflict amongst investors (Anderson et al., 2012; Massoud et al., 2011) that may dominate their positive governance role. However, in less transparent emerging markets, the benefits of an institutional block-holder governance role via informed trading may dominate costs associated with such activity.

In terms of the control variables, Table 4 indicates that older firms have a lower Tobin's Q compared to their younger peers. Tobin's Q is also positively affected by firm growth and negatively affected by past performance. This indicates that in Hong Kong investors tend to buy low-profitability companies and sell high-profitability ones, and there is tendency for the market to converge (Fama and French, 2000; Knapp et al., 2006).

4. Discussion and conclusions

Previous agency research has documented a relationship between block-holders and firm value (Laevin and Levine, 2008; Attig et al., 2008). This paper contributes to the literature on agency theory by providing evidence that links multiple block-holder ownership to organisational outcomes through both the level and structure of informed trading as two important price transmission mechanisms. By focusing on informed trading as a governance mechanism, the paper examines the effects of a controlling family and minority institutional block-holders. Using a sample of 447 listed companies listed on the Hong Kong Stock Exchange, this study shows that large family owners reduce transparency in order to benefit

from private benefits of control, negatively affecting firm valuation. In contrast, non-controlling institutional block-holders provide governance effects via informed trading, which mitigate overall informed trading and improves its structure, benefitting all shareholders. Results show that for governance to be effective via informed trading, non-controlling institutional block-holders use absolute ownership to strengthen their loyalty to the large family owner, and their relative power to strengthen the conditions of such loyalty.

This paper also separates the conflicting objectives of multiple block-holders and the effect on company valuation in the stock market. Both large family controllers and institutional block-holders are associated with governance costs and benefits. By closely monitoring the fundamental investment value of the firm and the threat of negative informed trading, institutional block-holders and controlling families affect opportunistic opacity. This ensures that the negative private information is more equally available to all investors, which may mitigate negative informed trading. By initiating and/or promoting more informed trading on positive strategic private information, institutional block-holders and the controlling family improve the structure of informed trading. This protects firm competitive advantage and improves market efficiency, bringing net benefits to all investors.

Thus, information disclosure is associated with important governance trade-offs when multiple institutional block-holders attempt to offset their monitoring costs with the benefits of potential profit from informed trading. This analysis shows that multiple block-holders may play dual governance roles by supporting long-term wealth generation while engaging in an opportunistic wealth distribution in an environment of corporate opacity. The different effects from the controlling family and institutional block-holders lead to efficiency trade-offs. One extension of this discussion would be to see if these differences extend to other types of family firms (Villalonga and Amit, 2006; 2010). For example, it would be important

to explore whether agency conflicts are different in founder-controlled firms compared to companies where family control has been transferred from founder to heir.

Finally, the paper shows that the connection between family control and different types of monitoring is relevant in shaping agency problems, in line with Maury (2006). The models estimated here investigate the effects of owner identity and reveal that only when institutional block-holders are pressure-resistant with regard to the largest controlling family, is informed trading low and its structure is good. This indicates that pressure-sensitive or pressure-uncertain institutional block-holders do not moderate agency costs or support information quality. Therefore pressure-resistant institutional block-holders represent a flexible and efficient private enforcement mechanism in terms of information disclosure, and provide an alternative solution to public enforcement, which can lower agency problems associated with controlling families. This source of governance via informed trading can also complement legal and regulatory institutions, thus improving market efficiency. This is especially useful for stock exchanges in emerging economies by helping to achieve investor protection as well as an efficient price discovery function, increasing their competitiveness in global financial markets.

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Table 1.**Panel A: Descriptive Statistics**

| | Mean | Standard Deviation | Min | Max |
|--|-------|-----------------------|--------|--------|
| Informed Trading and The Structure of Informed Trading in Hong Kong | | | | |
| 1.PIN | 0.30 | 0.13 | 0.08 | 0.84 |
| 2.DF | -0.02 | 0.15 | -0.77 | 0.40 |
| Ownership Structure Variables | | | | |
| 3.Family Controller' Ownership (n=361) | 48.77 | 17.70 | 10.00 | 89.64 |
| 4.Institutional Block-holders' Ownership (n=173) | 14.09 | 8.39 | 5.00 | 41.69 |
| 5.Institutional Block-holders' Relative Power over Family | 0.38 | 0.39 | 0.07 | 2.40 |
| 6. Pressure-Resistant Institutional Block-holders' Ownership (n=129) | 12.15 | 7.07 | 5.00 | 35.04 |
| 7. Pressure-Resistant Institutional Block-holders's Relative Power over Family | 0.31 | 0.24 | 0.07 | 1.08 |
| 8. Pressure Sensitive institutional block-holders' Ownership (n=62) | 9.19 | 3.87 | 5.00 | 21.95 |
| 9. Pressure-Sensitive Institutional Block-holders' Relative Power over family | 0.26 | 0.23 | 0.07 | 1.40 |
| 10.Pressure-Uncertain Institutional Block-holders' Ownership (n=25) | 11.96 | 7.61 | 5.86 | 32.31 |
| 11. Pressure-Uncertain Institutional Block-holders' Relative Power | 0.40 | 0.49 | 0.08 | 2.40 |
| Firm Valuation | | | | |
| 12.Tobin's Q 06 | 1.57 | 2.70 | 0.20 | 25.84 |
| Control Variables | | | | |
| 13.Ln Market Capitalization of Equity | 21.00 | 1.96 | 17.11 | 27.93 |
| 14.Ln Share Liquidity | 13.79 | 1.98 | 7.86 | 20.12 |
| 15.Daily Return Risk | 12.85 | 9.56 | 1.75 | 74.77 |
| 16. Leverage | 19.67 | 18.33 | 0 | 110.66 |
| 17.ROE | 0.07 | 1.62 | -21.34 | 17.58 |
| 18.Growth | 0.60 | 3.35 | -1.00 | 53.58 |
| 19. Ln Aanalyst Coverage | 0.74 | 1.05 | 0 | 3.56 |
| 20.Ln Firm Age | 2.40 | 0.71 | 0 | 3.56 |

Note: PIN is the proxy of informed trading DF is the proxy of the structure of informed trading, measured by the difference between the levels of informed trading on positive and negative private information. Family ownership is measured by the equity holding of the largest individual shareholder and close family. Institutional block-holders' ownership is measured by the equity holding of all institutional investors with more than 5 percent shareholdings. The institutional block-holders' relative power in large family controlled multiple block-holder ownership structure is measured by the ratio of the ownership of institutional block-holders to that of the controlling family. Institutional block-holders are defined as pressure-sensitive, pressure-resistant and pressure-uncertain based on their business links with their invested companies. The pressure-resistant group only includes pension funds, investment companies, independent investment advisors and independent research institutes and foundations. Banks, bank trusts and insurance companies are included in the pressure-sensitive group. Industrial and public institutions, and other unclassified institutional investors whose business links with the invested companies are not clear are put into the pressure-uncertainty group. We use three ownership variables for institutional block-holders that are defined as total ownership stakes held by pressure-sensitive, pressure-resistant and pressure-uncertain institutional investors. Tobin's Q is calculated as the market value of total assets divided by the book value of total assets at the end of 2006. Market capitalisation of common equity is calculated as the number of outstanding shares times the closing price in the end of 2006. Share liquidity is measured by average monthly trading volume in 2006. The daily return risk is the standard deviation of daily share return in 2006. Leverage is the ratio of long term debt over common equity in the end of 2006. Firm age is measured by the number of years listed on the Hong Kong Stock Exchange in year 2006. Financial

analysts' coverage is measured by the number of the first year forward EPS estimates available from Institutional Brokers' Estimate System (I/B/E/S) in the end of 2006. Growth is the sale revenue change from 2005 to 2006 divided by sale revenue in 2005. ROE is measured by the ratio of EPS over the book value per share in year 2005. N=447.

Panel B: Correlation Matrix for Key Variables

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|----------|----------|----------|----------|----------|---------|---------|
| 1.Tobin's Q | 1.00 | | | | | | |
| 2.DF | 0.08** | 1.00 | | | | | |
| 3.PIN | -0.18*** | -0.33*** | 1.00 | | | | |
| 4.Family Controller' Ownership | 0.02 | -0.10** | 0.25*** | 1.00 | | | |
| 5.Non-controlling Institutional Block-holders' Ownership | 0.03 | 0.17*** | -0.12*** | -0.11** | 1.00 | | |
| 6.Institutional block-holders' relative power over family | 0.08 | 0.15*** | -0.13*** | -0.24*** | 0.834 | 1.00 | |
| 7. Ln Market Capitalization of Equity | 0.26*** | 0.16*** | -0.53*** | -0.15*** | 0.11*** | 0.06 | 1.00 |
| 8.Ln Share Liquidity | 0.26*** | 0.17*** | -0.46*** | -0.27*** | 0.08* | 0.13*** | 0.30*** |
| 9.Daily Return Risk | 0.10** | 0.12** | 0.05 | -0.03 | -0.05 | 0.03 | -0.41 |
| 10. Leverage | 0.01 | -0.07 | 0.01 | -0.04 | -0.03 | -0.03 | 0.05 |
| 11.Growth | -0.03 | -0.06 | 0.02 | -0.08* | -0.03 | -0.02 | -0.01 |
| 12.ROE | -0.04 | 0.14*** | -0.12*** | 0.03 | 0.04 | 0.02 | 0.19 |
| 13. Ln Aanalyst Coverage | 0.25*** | 0.13*** | -0.50*** | -0.21*** | 0.16*** | 0.11*** | 0.80*** |
| 14.Ln Firm Age | -0.07 | -0.01 | -0.07 | -0.03 | -0.12*** | -0.10 | 0.17*** |
| Variable | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 8.Ln Share Liquidity | 1.00 | | | | | | |
| 9.Daily Return Risk | 0.12*** | 1.00 | | | | | |
| 10. Leverage | 0.05 | -0.03 | 1.00 | | | | |
| 11.Growth | -0.01 | -0.02 | -0.01 | 1.00 | | | |
| 12.ROE | 0.06 | -0.05 | -0.01 | 0.01 | 1.00 | | |

| | | | | | | | |
|--------------------------|---------|----------|-------|-------|---------|-------|------|
| 13. Ln Aanalyst Coverage | 0.35*** | -0.29*** | 0.08* | -0.03 | 0.11*** | 1.00 | |
| 14.Ln Firm Age | -0.06 | -0.07 | 0.05 | 0.04 | 0.03 | -0.03 | 1.00 |

Correlations are for the sample of 447 observations. Correlations significant at the 10%/5%/1% level or lower are noted with */**/** respectively. See Table 1Panel A for variable definitions.

Table 2 Institutional Block-holders and Family Owner in Informed Trading and Its Structure

| Dependent variable | Model 1 PIN | Model 2 PIN | Model 3 PIN | Model 4 DF |
|---|---------------------|---------------------|---------------------|--------------------|
| Family ownership | 0.04** [2.11] | 0.04** [2.08] | 0.04** [2.38] | -0.01 [-0.85] |
| Institutional Blockholders' Ownership | --- | -0.002 [-0.40] | 0.03 [1.07] | 0.02** [2.07] |
| Institutional Block-holders' Ownership/Family's Ownership | --- | --- | -0.05** [-1.98] | 0.003 [0.39] |
| Ln Market Capitalization of Common Equity | -0.03*** [-5.12] | -0.05*** [-4.99] | -0.05*** [-4.90] | 0.02** [-2.56] |
| Ln Share Liquidity | -0.02*** [-5.85] | -0.03*** [-5.60] | -0.03*** [-4.90] | 0.02** [2.44] |
| Daily Return Volatility | -0.01** [-2.30] | -0.01** [-2.32] | -0.01** [-2.15] | 0.03*** [3.09] |
| Growth | -0.01 [-1.50] | -0.01 [-1.52] | -0.01 [-1.51] | -0.01*** [1.09] |
| Ln Firm Age | -0.01 [-0.04] | 0.01 [0.05] | 0.01 [0.08] | -0.000 [-0.00] |
| Ln Analyst Coverage | -0.01*** [-6.84] | -0.01*** [-6.56] | -0.01*** [-6.78] | 0.001 [0.10] |
| ROE | -0.004 [-0.94] | -0.01 [-0.05] | -0.01 [-1.30] | 0.02 [0.82] |
| Industry Dummies | Yes | Yes | Yes | Yes |
| N | 447 | 447 | 447 | 447 |
| Adj R-squared | 0.376 | 0.355 | 0.390 | 0.128 |

Note: Table 2 shows the results of the OLS regression on institutional block-holders and family ownership in the level and the structure of informed trading. Dependent variable in Model 1, 2 and 3 is firm informed trading level (PIN). Dependent variable in model 4 is the structure of informed trading (DF). Variable definitions are given in Table 1. All coefficients are standardized; *p≤0.10; **p≤0.05; ***p≤0.01; t-statistics in parentheses.

Table 3. Different Type of Institutional Block-holders in Informed Trading and Its Structure

| Dependent variable | Model 5 PIN | Model 6 DF | Model 7 PIN (PSM Matched sample) | Model 8 DF(PSM Matched sample) |
|---|---------------------|---------------------|---|---|
| Family's Ownership | 0.04** [2.40] | -0.01 [-0.77] | 0.06*** [3.20] | -0.01 [-1.22] |
| Pressure-Resistant Institutional Block-holders' Ownership | 0.04 [1.23] | 0.02*** [3.36] | 0.05 [1.15] | 0.02*** [5.47] |
| Pressure-Sensitive Institutional Block-holders' Ownership | -0.01 [-0.50] | -0.001 [-0.08] | 0.03 [0.58] | -0.001 [-0.28] |
| Pressure-Uncertain Institutional Block-holders' Ownership | 0.01 [0.30] | -0.001 [-0.14] | -0.01 [-0.12] | 0.001 [0.54] |
| Pressure-Resistant Institutional Block-holders' Ownership/Family's Ownership | -0.05** [-1.96] | -0.06 [-0.73] | -0.08** [-1.98] | -0.07 [-0.88] |
| Pressure-Sensitive Institutional Block-holders' Ownership/Family's Ownership | 0.004 [0.19] | 0.09 [1.16] | -0.01 [-0.28] | 0.07 [1.16] |
| Pressure-Uncertain Institutional Block-holders' Ownership/Family's Ownership | -0.02 [-1.02] | -0.01 [-0.08] | -0.01 [-0.22] | -0.01 [-0.20] |
| Ln Market Capitalization of Common Equity | -0.04** [-2.05] | 0.02** [2.50] | -0.09*** [-8.78] | 0.06*** [8.54] |
| Ln Share Liquidity | -0.10*** [-5.77] | 0.02** [2.48] | -0.04*** [-6.36] | -0.002 [-0.61] |
| Daily Return Volatility | -0.03 [-1.53] | 0.03*** [3.11] | -0.01*** [-4.00] | 0.005*** [5.92] |
| Growth | 0.003 [0.76] | -0.01*** [-5.86] | -0.02*** [-2.74] | 0.01** [2.05] |
| Ln Firm Age | -0.03 [-1.60] | -0.000 [-0.01] | 0.02 [0.86] | -0.05*** [-5.14] |
| Ln Analyst Coverage | -0.13*** [-6.34] | 0.0001 [0.06] | -0.11** [-2.27] | -0.04*** [-3.70] |
| ROE | -0.02 [-1.02] | 0.02 [0.82] | 0.01 [0.63] | 0.01* [1.89] |
| Industry Dummies | Yes | Yes | Yes | Yes |
| N | 447 | 447 | 722 | 722 |
| Adj R-squared | 0.392 | 0.116 | 0.420 | 0.148 |

Note: This table shows the results of the OLS regression on family owners and different type of institutional block-holders in informed trading and its structure. Variable definitions are given in Table 1. Model 5 and 6 use original 447 sample while Model 7 and 8 use the propensity score matched sample in which we match 361 family to 361 nonfamily firms based on pressure-resistant institutional block-holders ownership, pressure-sensitive institutional block-holders ownership, pressure-uncertain institutional block-holders ownership, market capitalization, liquidity,

daily return risk, return on equity, growth, analyst coverage, and firm age. Dependent variable in Model 5 and 7 is firm informed trading level (PIN). Dependent variable in Model 6 and 8 is the structure of informed trading (DF). All coefficients are standardized; * $p \leq 0.10$; ** $p \leq 0.05$; *** $p \leq 0.01$; t-statistics in parentheses.

Table 4 Informed trading, its structure, and company valuation

| Dependent variable | Model 9 Tobin's Q | Model 10 Tobin's Q | Model 11 Tobin's Q | Model 12 Tobin's Q |
|--|----------------------|-----------------------|-----------------------|-----------------------|
| Largest Family Ownership | --- | --- | --- | 0.12** [2.27] |
| Pressure-Resistant Institutional Block-holders' Ownership | --- | --- | --- | -0.14** [-1.96] |
| Pressure-Resistant Institutional Block-holders' Ownership/Family's Ownership | --- | --- | --- | 0.08 [1.27] |
| PIN | -0.03 [-0.62] | --- | --- | --- |
| DF | 0.11*** [2.58] | --- | --- | --- |
| E[PIN] | --- | -0.40*** [-4.83] | --- | -0.36*** [-3.02] |
| E[DF] | --- | --- | 0.21*** [3.96] | 0.16** [2.20] |
| Ln market capitalisation of common equities | 0.28*** [5.27] | 0.00 [0.00] | 0.25*** [5.15] | 0.01 [0.13] |
| ROE | -0.12*** [-2.71] | -0.12*** [-2.80] | -0.15*** [-3.29] | -0.15*** [-3.40] |
| Sale Growth | 0.25*** [3.66] | 0.21*** [3.09] | 0.19*** [2.84] | 0.15** [2.13] |
| Leverage | 0.06 [1.38] | 0.05 [1.09] | 0.06 [1.28] | 0.04 [0.79] |
| Ln Firm Age | -0.15*** [-3.33] | -0.14*** [-3.16] | -0.13*** [-2.88] | -0.13*** [-2.88] |
| Industry Dummies | Yes | Yes | Yes | Yes |
| N | 447 | 447 | 447 | 447 |
| Adj R-squared | 18.77 | 21.68 | 20.33 | 24.12 |

Note: This table shows the results of the informed trading and its structure in company valuation. Dependent variable is Tobin's Q. E[PIN] is the firm-level private information estimated based on Model 5 in Table 3. E[DF] is the explainable structure of informed trading to investors estimated based on Model 6 in Table 3. Variable definitions are given in Table 1. All coefficients are standardized; *p≤0.10; **p≤0.05; ***p≤0.01; t-statistics in parentheses.